

Notice of Allowability

Application No.

10/777,363

Examiner

Anthony Mackowey

Applicant(s)

SUMITOMO ET AL.

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 03 August 2007.
2. ☒ The allowed claim(s) is/are 3,4,9,10,16-28; renumbered 1-17.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Claims 3 and 16 recite, "a count portion for counting the number of times of overlapping of the template with the one or more open curves for each pixel in the edge image when the overlapping portion performed the overlapping process for each pixel on an edge of the edge image, wherein the template memory portion has a template that is made of one or more open curves indicating a part of a contour of a model of the object or a part of the model and a point indicating a predetermined position of the model, and is made by rotating the one or more open curves around the point by a half-turn, the overlapping portion overlaps the edge image with the template so that a pixel on the edge of the edge image matches the point of the template, and the detection portion detects the object by calculating the matching degree in accordance with the number of times counted by the count portion."

Claim 9 recites, "a step for counting the number of times of overlapping of the template with the one or more open curves for each pixel in the edge image when performing the overlapping process for each pixel on an edge of the edge image, wherein the template is a template that is made of one or more open curves indicating a part of a contour of a model of the object or a part of the model and a point indicating a predetermined position of the model, and is made by rotating the one or more open curves around the point by a half-turn, the step for overlapping includes overlapping the edge image with the template so that a pixel on the edge of the edge image matches the point of the template, and the step for detecting includes detecting the object by calculating the matching degree in accordance with the number of times counted in the step for counting."

The above features, as explicitly recited, in combination with the other elements of the claims and base claims are neither disclosed nor suggest by the prior art or record. Wenzel teaches the template may be a rotated version of an original template (page 22, paragraph 338) and a matching distance between the template and target image but does not disclose counting the number of times of overlapping between the template and the target image as required by claims 3, 9 and 16. Although other prior art teaches counting the number of overlaps between a template and a target image (US 6,665,446 to Kato) the Examiner believes the counting of the overlapped portions and detection based on the count as explicitly recited by the claims is not combinable with the matching distance technique taught by Wenzel.

JP 2000-082146 teaches template matching using partial curves. However, the template is not made by rotating the partial curves about a point indicating a predetermined position of the model nor does the reference disclose or suggest overlapping the edge image with the template so that a pixel on the edge image of the edge image matches that point and then counting the overlaps of the template curves with the edge image.

Claim 4 recites, "a brightness image generation portion for generating a brightness image of the entered image; and an average brightness calculation portion for calculating an average brightness of an image area of the generated brightness image, wherein the template memory portion memorizes a template consisting of one or more open curves indicating a part of a contour of a model of the object or a part of the model and a plurality of areas sandwiching the one or more open curves, the average brightness calculation portion calculates an average brightness of each image area of the brightness image overlapping the plural areas of the template when overlapping the template with each position of the generated brightness image,

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and the detection portion detects the object by calculating the matching degree in accordance with the average brightness of each of the image areas of the brightness image that was calculated by the average brightness calculation portion.”

Claim 10 recites, “a step for generating a brightness image of the entered image; and a step for calculating an average brightness in an image area of the generated brightness image, wherein the template is a template that is made of one or more open curves indicating a part of a contour of a model of the object or a part of the model and a plurality of areas sandwiching the one or more open curves, the step for calculating an average brightness includes calculating an average brightness of each image area of the brightness image overlapping the plural areas of the template when overlapping the template with each position of the generated brightness image, and the step for detecting includes detecting the object by calculating the matching degree in accordance with the calculated average brightness of each of the image areas of the brightness image.”

The above features, as explicitly recited, in combination with the other elements of the claims and base claims are neither disclosed nor suggest by the prior art of record. Wenzel does not disclose the use of the brightness image or the calculation of the average brightness of an area of the brightness image or calculating the average brightness in the areas of overlap between the target image and the template image. The Examiner believes a technique utilizing the brightness images and average brightness of overlapping regions of the template and target images as explicitly recited in the claims is not combinable with the matching distance technique taught by Wenzel. JP 2000-082146 also does not disclose or suggest use of the brightness image

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or the calculation of the average brightness of an area of the brightness image or calculating the average brightness in the areas of overlap between the target image and the template image.

US 2003/0103648 to Ito et al. discloses an object tracking apparatus that performs a template matching calculation which includes the calculation of the average brightness of the input image and the average brightness of the template image (Fig. 2; page 2). However, the correlation equation taught by Ito appears to only use the average brightness calculations for normalization of the brightness of the search area of the input image (the equation $y(x,y,u,v)$ shows the average brightness is subtracted out). The correlation is based on the degree of coincidence between the brightness value distribution of the area, not on the degree of matching of the average brightness. The template taught by Ito is a masked region of an entire person/object from a previous image in the sequence, not one or more open curves indicating a part of a contour of a model of the object or a part of the model and a plurality of areas sandwiching the one or more open curves.

Claims 21 and 22 depend from claim 3; claims 23 and 24 depend from claim 4; claims 25 and 26 depend from claim 9; claims 27 and 28 depend from claim 10; and claims 17-20 depend from claim 16 and therefore incorporate all the limitations of the claims from which they depend.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

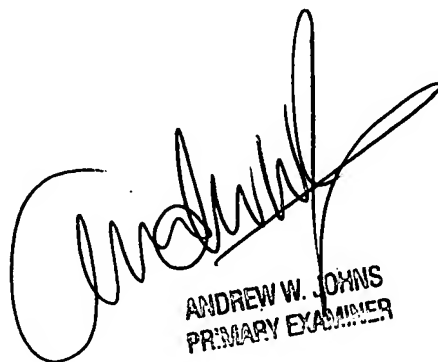
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Mackowey whose telephone number is (571) 272-7425. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bella Matthew can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AM
8/15/07



ANDREW W. JOHNS
PRIMARY EXAMINER